TM 55-1510-209-CL-1

TECHNICAL MANUAL

Operator's and Crewmember's Checklist

ARMY MODELS RU-21A AND RU-21D AIRCRAFT

Pilot's Checklist

This copy is a reprint which includes current pages from Changes 1 through 4.

HEADQUARTERS
DEPARTMENT OF THE ARMY
3 SEPTEMBER 1982

CHANGE NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 27 September 1990

Operator's and Crewmember's Checklist

ARMY MODELS
RU-21A AND RU-21D
AIRCRAFT

Pilot's Checklist

TM 55-1510-209-CL-1, 3 September 1982, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
4-19 through N-22	N-19 through N-22
E-9 and E-10	E-9 and E-10
E-19 and E-20	E-19 and E-20

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

THOMAS F. SIKORA
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, -10 & CL Maintenance requirements for RU-21A and RU-21D Airplane, Reconnaissance.

CHANGE NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 2 November 1988

Operator's and Crewmember's Checklist

ARMY MODELS
RU-21A AND RU-21D
AIRCRAFT

Pilot's Checklist

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Remove pages	Insert pages
i and ii	i and ii
N-1 through N-8	N-1 through N-8
N-11 through N-14	N-11 through N-14
N-17 through N-20	N-17 through N-20
E-1 through E-14	E-1 through E-14
E-17 and E-18	E-17 and E-18
P-3 through P-10	P-3 through P-9/P-10

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TM 55-1510-209-CL-1
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TM 55-1510-209-CL-1
C 2

CHANGE NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 14 May 1988

TECHNICAL MANUAL

Operator's and Crewmember's Checklist

ARMY MODELS
RU-21A AND RU-21D
AIRCRAFT

Pilot's Checklist

TM 55-1510-209-CL-1, 3 September 1982, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
N-5 through N-8	N-5 through N-8
P-1 and P-2	P-1 and P-2

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CHANGE NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 26 MARCH 1985

Operator's and Crewmember's Checklist

ARMY MODELS
RU-21A AND RU-21D
AIRCRAFT

PILOT'S CHECKLIST

TM 55-1510-209-CL-1, 3 September 1982, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
N-21 and N-22	N-21 and N-22
E-9 and E-10	E-9 and E-10

2. Retain these sheets in front of manual for reference purposes.

TM 55-1510-209-CL-1
C 1

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, CL Requirements for U-21A/RU-21A&D Aircraft.

GENERAL INFORMATION AND SCOPE

SCOPE. This checklist contains the operator's check to be accomplished during normal and emergency operations.

GENERAL INFORMATION. The checklist consists of three parts: normal procedures, emergency procedures, and performance data. Normal procedures consist of the procedures required for normal flight and those required 'Before Landing'. The normal procedures portion will be subdivided to include the before landing checks of Chapter 8 of the Operator's Manual. Emergency procedures are subdivided into 8 classifications as follows: Engine, Propeller, Fire, Fuel, Electrical, Landing, Ditching and Bailout. Performance data consists of performance checks.

NOTE

This checklist does not replace the amplified version of the procedures in the operator's manual (TM 55-1510-209-10-1), but is a condensed version of each procedure.

NORMAL PROCEDURES PAGES. The contents of the normal procedures of this manual are a condensation of the amplified checklist appearing in the normal procedures or crew duties portion of the applicable operator's manual.

EMERGENCY PROCEDURES PAGES. The requirements in this section of the condensed checklist manual (CL) are identical to those for the normal procedures, except that the information is drawn from the amplified checks in the emergency procedures portion of the operator's manual. The emergency requirements are subdivided into the 8 classifications listed above. Immediate action items are underlined for your reference and shall be committed to memory.

Symbols Preceding Numbered Steps.

* - Indicates performance of steps is mandatory for all "Thru Flights".

N - Means performance of step is mandatory for "Night Flights".

★ - Indicates a detailed procedure for this step is included in the Performance Checks section, located at the back of the checklist.

I - Indicates mandatory check for "Instrument Flights".

O - Indicates if installed.

(2) - Indicates Copilot's Duties

Immediate action emergency items are underlined.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of the applicable Aircraft Operator's Manual direct to Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MPSD, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished to you.

BEFORE EXTERIOR CHECK

* 1. Publications – Check.

* 2. Oxygen system pressure gages – Check.

3. Keylock switch – Off.

4. Fuel firewall valves – OPEN and safetied.

5. Flight controls – Unlocked.

6. Parking brake – Set.

7. Trim tabs – Zero.

* 8. Gear Handle – Down.

* 9. Battery – ON (stabilized at 22 volts minimum).

10. Rotating beacons – Check illumination and rotation.

11. Lighting systems – Check as required.

★ 12. Pitot and stall warning heat system – Check.

13. Battery – OFF.

14. Safety belts, shoulder harnesses, inertia reels – Check condition and operation.

15. Fire extinguishers (2) – Check.

16. Fire axe – Secured.

17. First aid kits (5) – Check.

18. Mission/INS equipment – Secured.

EXTERIOR CHECK

FUEL AND ANTENNAS

* 1. Fuel sample – Check.

2. Antenna configuration – Check.

LEFT WING

1. Skin condition – Check.

2. Controls, flaps and trim tabs – Check.

3. Static wicks – Check.

(O) 4. Wing antenna pod – Check.

(O) 5. Wing pod navigation lights (2) – Check.

(O) 6. Wing tip and navigation light – Check.

(O) 7. Antennas – Check.

8. Landing light – Check.

9. Tiedown – Released.

10. Fuel vent (1) – Check.

* 11. Wing tank fuel and cap – Check.

12. Deicer boot – Check.

13. Wing ice light – Check.

14. Fuel vents (2) – Check.

(O) 15. Antennas – Check.

16. Inverter air intake screen and exhaust port – Check.

LEFT MAIN LANDING GEAR

* 1. Tire – Check.

2. Brake assembly – Check.

* 3. Shock strut – Check.

4. Torque knee – Check.

5. Safety switch – Check.

6. Wheel well general condition – Check.

* 7. Doors and linkage – Check.

8. Air bypass and oil cooler (rear) – Check.

9. Firewall fuel filter drain (at inertial separator duct) – Turn/release.

LEFT ENGINE AND PROPELLER

1. Accessory section exhaust vent – Check.

2. Left cowl locks – Locked.

3. Left exhaust stub – Check.

* 4. Propeller blades and spinner – Check.

* 5. Nacelle air intake – Check.

6. Nacelle lip ice boot – Check.

* 7. Oil cooler air intake – Check.

8. Right cowl locks – Locked.

9. Right exhaust stub – Check free of obstructions.

* 10. Engine compartment – Check.

* 11. Nacelle tank fuel and cap – Check.

(O) 12. Fuel filter drain ring – Pull/release.

* 13. Engine compartment access door – Locked.

(O) 14. Engine wash access door – Locked.

FUSELAGE UNDERSIDE

1. General condition – Check.
2. Antennas – Check.
3. Rotating beacon – Check condition.

LEFT NOSE AVIONICS COMPARTMENT

(O) 1. Voice security computer – Installed/keyed.

2. Transponder – Set.
3. Left nose avionics compartment access door – Secured.
4. Inverter intake screen and exhaust port – Check.

NOSE SECTION

1. Wheel well condition – Check.
2. Doors and linkage – Check.
3. Nose gear turning stop – Check condition.

* 4. Tire – Check.

5. Torque knee – Check.
6. Shock strut – Check.

7. Shimmy damper and attaching linkage – Check.
8. Taxi light – Check.
9. Radome – Check.
10. Windshield and wipers – Check.
11. Ram air intake – Check.
12. Ram air intake lip ice boot – Check.
13. Right nose avionics compartment access door – Secured.
14. Drift sight window – Check.
15. Battery compartment access panel – Secured.

RIGHT ENGINE AND PROPELLER

1. Accessory section exhaust vent – Check.
2. Left cowl locks – Locked.
3. Left exhaust stub – Check.
* 4. Propeller blades and spinner – Check.
* 5. Nacelle air intake – Check.
6. Nacelle lip ice boot – Check.
* 7. Oil cooler air intake – Check.
8. Right cowl locks – Locked.
9. Right exhaust stub – Check.
* 10. Engine compartment – Check.
* 11. Nacelle tank fuel and cap – Check.

(0) 12. Fuel filter drain ring - Pull/release.

* 13. Engine compartment access door Locked.

(0) 14. Engine wash access door - Locked.

RIGHT MAIN LANDING GEAR

* 1. Tire - Check.

2. Brake assembly - Check.

* 3. Shock strut - Check.

4. Torque knee - Check.

5. Safety switch - Check.

6. Wheel well general condition - Check.

* 7. Doors and linkage - Check.

8. Air bypass and oil cooler (rear) - Check.

(0) 9. Firewall fuel filter drain (at inertial separator duct) - Turn/release.

RIGHT WING

1. Inverter air intake screen and exhaust port - Check.

(0) 2. Antennas - Check.

3. Fuel vents (2) - Check.

4. Heated battery vent - Check.

5. Wing ice light - Check.

6. Deicer boot - Check.

7. Wing tank fuel and cap - Check.

8. Fuel vent (1) - Check.

* 9. Tiedown - Released.

10. Landing light - Check.

* 62. Voltage – Check (28 VDC maximum).

(O) 63. Battery fault reset light – Press to test.

* 64. Annunciator panel – Test.

* (N) 65. Navigation lights – ON.

* 66. Landing gear handle lights – Test.

* 67. Landing gear down indicator lights (3) – Illuminated.

68. Keylock switch – On.

* 69. Fire detection system – Test.

70. Fault warning button – BPress.

* 71. Generators – OFF.

*INS ALIGNMENT BEFORE ENGINE START

1. Main inverter switch – STBY. Check, return switch to OFF.
2. Main inverter switch – MAIN. Check, return switch to ON.
3. Inertial inverter switch – STBY. Check, return switch to OFF.
4. Inertial inverter switch – INERTIAL. Check, return switch to ON.
5. INS – Align.
6. BUS ISO switch – BUS ISO.

*STARTING ENGINES (BATTERY/GPU)

START PROCEDURE

1. Rotating beacons – ON.

(N) 2. Navigation lights – ON.

3. Boost pumps (2) – ON. Check both BOOST FAIL lights extinguished.

4. Propeller – Clear.

5. Ignition/start switch – ON (Check IGN ON light illuminated).

6. Condition lever – LO IDLE (after N_1 stabilizes at or above 12% for 5 seconds).

7. ITT – Monitor (1090°C maximum for engine being started. 750°C maximum for operating engine).

8. Ignition/start switch – STOP (after ITT has stabilized, IGN ON light extinguished).

9. Condition lever – As required. HIGH IDLE (first engine battery start only). LOW IDLE for second engine start.

10. Generator (for battery start) – ON or RESET, then ON as required. GEN light extinguished.

11. Main inverter – STBY.

12. Fuel pressure – Check (15 PSI minimum).

13. Oil pressure – Check (40 PSI minimum).

14. Main inverter – Off.

15. Right propeller – FEATHER to disconnect GPU.

21. Marker beacon/glideslope receiver VOL control – OFF.

22. Pilot's flight instruments – Check.

(O) 23. ADF/UHF DF switch – ADF position.

(O) 24. TACAN/INS switch – As required.

(O) 25. MD-1/INS switch – As required.

26. Compass slave MAG/DG switch – As required.

(O) 27. TACAN norm/auto switch – As required.

28. Pilot's course indicator switch – As required.

* 29. Engine instruments – Check.

(O) 30. RHAW – As required.

31. Instrument panel radios and radar equipment – OFF.

32. INS mode switch – As required.

33. Copilot's course indicator switch – As required.

(O) 34. TAC/INS switch – As required.

35. Copilot's flight instruments – Check.

36. Emergency static air source – NORM OFF.

37. Copilot's audio control panel – Set.

38. Copilot's circuit breaker and fuse panel – Check in.

39. Right subpanel circuit breakers – Check in.

40. Vent blower – OFF.

41. Heater – OFF.

42. Gear handle – DOWN.

43. Left subpanel light switches (4) – OFF.

(O) 44. Windshield anti-ice switches – OFF.

45. Deice cycle switch – centered (off).

46. Autofeather system – OFF.

47. Heat switches (8) – OFF.

48. BUS ISO switch – Down (off).

(O) 49. Engine wash – OFF.

(O) 50. AC external power switch – OFF.

51. Landing lights – OFF.

52. Engine ice vanes – As required.

53. Ignition/start switches (2) – STOP.

(O) 54. Engine autoignition – OFF.

55. Inertial inverter – OFF.

56. Main inverter – OFF.

57. Mission equipment – OFF.

(O) 58. Mission equipment power switch – As required.

(O) 59. Mission avionics DC power switch – As required.

* 60. DC GPU – Connect as required.

* 61. Battery – ON.

6. Chocks – Removed.

INTERIOR CHECK

1. Ladder – Stowed.

(O) 2. Cargo/loose equipment – Secured.

* 3. Cargo door – LOCK.

* 4. Main entrance door – LOCK.

5. Cabin emergency exit hatch – Secured.

6. INS interface box circuit breakers – Check.

(O) 7. Flare/chaff dispenser preflight test – Completed.

(O) 8. Flare/chaff dispenser re-arm test – Conducted.

★* 9. Crew/passenger briefing – As required.

BEFORE STARTING ENGINES

* 1. Seats, pedals, belts, harness – Adjust.

2. Cockpit emergency entrance/exit hatch – Secured.

3. Overhead control panel switches – Set.

4. Magnetic compass – Check.

5. Free air temperature – Note current reading.

6. Fire detection test switch – OFF.

* 7. Power levers – IDLE.

* 8. Propeller levers – HIGH RPM.

* 9. Condition levers – FUEL CUTOFF.

10. Flaps – UP.

11. Control pedestal radios – OFF.

(O) 12. Flare/chaff dispenser control panel – Set.

(O) 13. Audio mission switches – VHF.

14. Landing gear emergency clutch disengage lever – Stowed.

15. Landing gear emergency extension handle – Stowed.

16. Fuel system circuit breakers – Check in.

17. Boost pumps – OFF.

18. Transfer pumps – OFF.

19. Crossfeed – CLOSED.

20. Pilot's audio control panel – Set.

(0) 11. Antennas - Check.
(0) 12. Wing tip and navigation light - Check.
(0) 13. Wing antenna pod - Check.
(0) 14. Wing pod navigation lights (2) - Check.
15. Static wicks - Check.
16. Controls, flaps and trim tabs - Check.
17. Skin condition - Check.
(0) 18. Chaff dispenser - Check.
(0)* 19. Flare/chaff safety pin - Remove.

FUSELAGE RIGHT SIDE

1. Skin condition - Check.
(0) 2. Flare/chaff test connection cap - Secure.
(0) 3. Flare dispenser - Check.
4. Air scoops - Check.
5. Cabin air exhaust vents - Check.
* 6. Antennas - Check.
7. Static port - Check.
* 8. Tiedown - Released.
(0)* 9. Tail stand - Removed.

EMPENNAGE

1. Right horizontal stabilizer deicer boots – Check.
2. Right horizontal stabilizer – Check.

(O) 3. VHF dipole antenna – Check.

4. Static wicks – Check.
5. Right elevator and trim tab – Check.
6. Navigation and beacon lights – Check.
7. Rudder and trim tab – Check.
8. Vertical stabilizer – Check.
9. Left elevator and trim tab – Check.
10. Static wicks – Check.
11. Left horizontal stabilizer – Check.

(O) 12. VHF dipole antenna – Check.

13. Left horizontal stabilizer deicer boot – Check.
14. Vertical stabilizer deicer boot – Check.

FUSELAGE LEFT SIDE

1. Static port – Check.
2. Cabin air exhaust vent – Check.

(O) 3. INS air intake screen and exhaust ports – Check.

4. Skin condition – Check.
5. Main entrance and cargo doors – Check.

16. Right propeller – HIGH RPM.
17. Loadmeter – Monitor (0.5 maximum).
18. Second engine – Start, (4) through (16) above.
19. Fuel control heat switches (2) – ON.
20. Bus ISO – OFF (as required).
21. Main inverters – MAIN INVERTER.
22. Inertial inverter – INERTIAL.
23. INS – STBY (as required).

ABORT START

1. Condition lever – FUEL CUTOFF.
2. Ignition/start switch – STARTER ONLY.
3. ITT – Monitor for drop in temperature.
4. Ignition/start switch – STOP.

ENGINE CLEARING

1. Condition lever – FUEL CUTOFF.
2. Ignition/start switch – STOP (allow 30 seconds delay after engine run-down).
3. Ignition/start switch – STARTER ONLY (for 30 to 40 seconds).
4. Ignition/start switch – STOP.

*BEFORE TAXIING

(O) 1. Radios – ON.

(O) 2. Mission equipment power switch – On (up).

★ 3. Oxygen system – Check as required.

(I)★ 4. Windshield anti-ice operation – Check.

5. Radios – Check.

(O)★ 6. Autopilot system – Check.

7. Taxi clearance – Check.

8. Clock – Set.

9. Altimeter – Set.

10. Parking brake – Release.

*TAXIING

1. Brakes – Check.

2. Flight instruments – Check.

3. Mission equipment checklist – Initiate.

ENGINE RUNUP

* 1. Nosewheel – center.

* 2. Parking brake – Set.

3. INS – As required.

* 4. Power levers – IDLE.

* 5. Condition levers – LO IDLE.

*★	6.	Manual crossfeed – Check.
★	7.	Fuel system crossfeed operation – Check.
*★	8.	Fuel transfer pumps – Check.
	9.	Flaps – Check.
	10.	Propeller manual feathering – Check.
*★	11.	Engine autoignition system – Check.
★	12.	Propeller autofeather system – Check.
★	13.	Overspeed governor – Check
	14.	Engine ice vanes (left and right) – PULL TO EXT.
★	15.	Primary governor – Check.
*★	16.	Secondary idle stop – Check.
	17.	Instrument suction – Check.
	18.	Pneumatic pressure – Check.
	19.	Volt loadmeters – Check.
(I)	20.	Propeller deice system – Check.
(I)	21.	Surface deice system – Check.
★	22.	Health indicator test (HIT) – As required.

*BEFORE TAKEOFF

1. Mission equipment – Check.
2. Fuel panel – Check.
3. Annunciator panel – Check.
4. Engine and flight instruments – Check.
5. Propeller levers – Check HIGH RPM.
6. Friction locks – Set.
7. Flaps – As required.
8. Trim – Set.
9. Engine ice vanes – As required.
10. Fuel control heat – Check ON.
11. Autofeather switch – Check ARM.

(I) 12. Navigation radios – Set.

(O) 13. INS destination – Set.

14. Flight controls – Check.
15. Mirror – Retracted.
16. Windows and doors – Secure.

(I) 17. Anti-icing/deicing/pitot heat – As required.

18. Crew/mission operators – Ready for takeoff.
19. INS – Insert time (monitor thumbwheel 7).

*LINE UP

1. Transponder – As required.
2. GYRO/INS heading – Check.
3. Power – Stabilized (70-80% N_1).
4. Autoignition – As required.
5. Landing/taxi lights – As required.

AFTER TAKEOFF

1. Gear – UP.
2. Flaps – UP.
3. Climb power – Set.

(O) ★4. Autopilot engagement – As required.

5. Autofeather – OFF.

(O) 6. Mission power – ON.

7. Wings and nacelles – Check.
8. Landing/taxi lights – As required.

(O) 9. Flare/chaff dispenser safety pin (electronic module) – Remove.

(O) 10. Flare/chaff dispenser arm-safe switch – ARM.

(O) 11. Chaff function selector switch – As required.

DURING CRUISE

1. Power – Set.
2. INS – As required.
3. Wings and nacelles – Check.
4. Deleted.

DESCENT – MAX RATE (CLEAN)

1. Power – IDLE.
2. Propellers – HIGH RPM.
3. Gear – UP.
4. Flaps – UP.
5. Airspeed – 208 KIAS maximum.

DESCENT – MAX ANGLE (LANDING CONFIGURATION)

1. Power – IDLE.
2. Propellers – HIGH RPM.
3. Flaps – APPROACH 174 KCAS (173 KIAS).
4. Gear – DOWN 156 KCAS (154 KIAS).
5. Flaps – DOWN 130 KCAS (127 KIAS).
6. Airspeed – 130 KCAS (127 KIAS).

DESCENT-ARRIVAL CHECK

1. Seat belts and shoulder harness – Secure.
2. Fuel panel – Check.
3. Parking brake handle – In.
4. Engine ice vanes – As required.
5. Mission power – OFF.
6. INS – As required.

(O) 7. Flare/chaff dispenser arm-safe switch – SAFE.

(O) 8. Flare/chaff dispenser safety pin (electronic module) – Insert.

BEFORE LANDING

1. Autofeather – ARM.
2. Flaps – APPROACH below 174 KCAS (173 KIAS).
3. Gear – DN below 156 KCAS (154 KIAS). Check lights.
4. Landing lights – On.

LANDING

(O) 1. Autopilot – Disengage.

2. Gear – Recheck DOWN.
3. Propellers – As required.

TOUCH AND GO LANDING

1. Flaps – As required.
2. Trim – Set.
3. Power – Maximum allowable.

GO-AROUND

1. Power — As required.
2. Gear — Up.
3. Flaps — Up.
4. LANDING LIGHTS — OFF.
5. Climb power — Set.

AFTER LANDING

1. Landing/taxi lights – As required.
2. Propellers – HIGH RPM.
3. Flaps – UP.
4. Autoignition – OFF.
5. Anti-icing/deicing – OFF.
6. Engine ice vanes – As required.
7. Radar/transponder – Standby.

(O) 8. Voice Security – Zeroize.

ENGINE SHUTDOWN

1. Parking brake – Set.
2. Landing/taxi lights – OFF.
3. Heater – OFF.
4. Vent blower – OFF.
5. Mission equipment – OFF.

(O) 6. Radios/radar/transponder – OFF and zeroized.

(O) 7. Radar signal detecting set and radar warning receiver – OFF.

8. Autofeather switches – OFF.
9. Heat switches (8) – OFF.

(O) 10. INS – Shut down.

11. Inverters – OFF.

12. Propellers – FEATHER.
13. Condition Levers – FUEL CUTOFF.
14. Boost pumps – OFF.
15. Transfer pumps – OFF.
16. Crossfeed – CLOSED.
17. Beacon/lighting systems – OFF.
18. Master switch – Down.

(O) 19. Oxygen regulator control levers – NORMAL, 100%, and OFF.

(O) 20. Oxygen console valve – OFF.

21. Keylock switch – OFF.

BEFORE LEAVING AIRCRAFT

1. Wheels – Chocked.
2. Parking brake – As required.
3. Flight controls – Locked.

(O) 4. Classified material – Inventoried, inspected and removed.

(O) 5. Mission equipment – Zeroized and inspected.

(O) 6. Voice security computer – Removed.

(O) 7. Transponder computer – Removed.

(O) 8. Transponder – Check zeroized.

9. Windows and doors – As required.

(O) 10. Flare/chaff dispenser wing safety pin – Insert.

11. Walkaround inspection – Completed.
12. DA Form 2408-12 and 13 – Completed.
13. Aircraft – Secure.

NOTE

The urgency of certain emergencies requires immediate and instinctive action by the pilot. The most important single consideration is aircraft control. All procedures are subordinate to this requirement.

ENGINE MALFUNCTION

ENGINE MALFUNCTION DURING TAKEOFF RUN (ABORT)

1. Power – IDLE.
2. Braking – As required.

ENGINE MALFUNCTION IMMEDIATELY AFTER TAKEOFF BELOW TAKEOFF AIRSPEED (V_{lof}) (SUFFICIENT RUNWAY)

1. Power – Reduce (as required to maintain directional control).
2. Land the aircraft.
3. Braking – As required.

ENGINE MALFUNCTION IMMEDIATELY AFTER TAKEOFF BELOW TAKEOFF AIRSPEED (V_{lof}) (INSUFFICIENT RUNWAY REMAINING)

1. Power – IDLE.
2. Land – Straight ahead.
3. Fuel firewall valves – CLOSED (LEFT and RIGHT).
4. Master switch – Down.

ENGINE MALFUNCTION AFTER TAKEOFF (FLIGHT CONTINUED)

1. Gear – UP.
2. Flaps – UP.
3. Power – As required.
4. Airspeed – Best single-engine rate of climb (V_{yse}).
5. Engine clean up – Perform.

ENGINE MALFUNCTION DURING FLIGHT

1. Power – As required.
2. Dead engine – Identify.
3. Power lever (dead engine) – IDLE.
4. Propeller (dead engine) – FEATHER.
5. Condition lever (dead engine) – FUEL CUTOFF.
6. Gear – UP.
7. Flaps – UP.
8. Power – Set.
9. Engine clean up – Perform.

ENGINE CLEANUP

1. Boost pump (dead engine) – OFF.
2. Crossfeed – CLOSED (if no restart is to be attempted).
3. Fuel firewall valve (dead engine) – CLOSED (if no restart is to be attempted).
4. Generator (dead engine) – OFF.
5. Electrical load – Monitor.

(O) 6. Autoignition (dead engine) – OFF.

7. Fuel control heat – OFF (dead engine, if no restart is to be attempted).

(O) 8. Mission equipment power switch – As required.

(O) 9. Mission avionics DC power switch – As required.

ENGINE MALFUNCTION DURING FINAL APPROACH

1. Power – As required.
2. Gear – Recheck DN.

ENGINE RESTART DURING FLIGHT (USING STARTER)

1. Electrical load – Reduce to minimum.
2. Power lever (dead engine) – IDLE.
3. Propeller (dead engine) – FEATHER.
4. Condition lever (dead engine) – FUEL CUTOFF.
5. Boost pumps (2) – ON.
6. Crossfeed – AUTO.
7. Fuel control heat – ON.
8. N_1 (live engine) – Reduce (90% or below to preclude exceeding the ITT temperature limit, 750°C).
9. Ignition/start switch – ON (monitor IGN ON light illuminated, N_1 over 13% and stabilized for approximately 5 seconds).
10. ITT (live engine) – Monitor (750°C maximum).
11. Condition lever – LO IDLE.
12. ITT and N_1 – Monitor (1090°C maximum).
13. Ignition/start switch – OFF, (when N_1 is above 50%, or start attempt is discontinued).
14. Engine clean up – Perform (if restart is unsuccessful).
15. Oil pressure – Check.
16. Generator – On.

17. Propeller – Synchronize.
18. Power – As required.
19. Electrical equipment – As required.

ENGINE RESTART DURING FLIGHT (NO STARTER ASSIST, ENGINE AND PROPELLER WINDMILLING)

1. Electrical load – Reduce to minimum.
2. Power lever (dead engine) – IDLE.
3. Propeller (dead engine) – HIGH RPM.
4. Condition lever (dead engine) – FUEL CUTOFF.
5. Boost pumps (2) – ON.
6. Crossfeed – AUTO.
7. Generator (dead engine) – Off.
8. Fuel control heat – ON.
9. Airspeed – 160 KIAS (minimum).
10. Altitude – Below 20,000 feet.
11. Autoignition – ARM.
12. Condition lever – LO IDLE.
13. ITT and N_1 – Monitor (1090°C maximum).
14. Engine clean up – Perform (if restart is unsuccessful).
15. Oil pressure – Check (40 PSI minimum).
16. Generator – On (when N_1 is above 50%).
17. Propeller – Synchronize.
18. Power – As required.

20. Autoignition - As required.
21. Electrical equipment - As required.
22. Crossfeed - As required.

SINGLE-ENGINE DESCENT ARRIVAL CHECK

1. Seat belts and shoulder harnesses – Secure (passengers checked).
2. Fuel panel – Check.
3. Parking brake handle – In.
4. Engine ice vanes – As required.
5. Mission power – OFF.

SINGLE-ENGINE BEFORE LANDING CHECK

1. Flaps – APPROACH below 174 KCAS (173 KIAS).
2. Gear – DN below 156 KCAS (154 KIAS). Check lights.
3. Landing lights – ON.

SINGLE-ENGINE LANDING CHECK

1. Gear – Recheck DN (check lights).
2. Propeller (live engine) – HIGH RPM.

SINGLE-ENGINE GO-AROUND

1. Power - Maximum allowable.
2. Gear - UP.
3. Flaps - UP.
4. Power - As required.
5. LANDING/TAXI LIGHTS - As required.

CHIP DETECTOR WARNING LIGHT ON

1. Engine instruments – Monitor.
2. Land as soon as practical.

PROPELLER

PROPELLER FAILURE

1. Airspeed – Reduce (increase aircraft pitch attitude).
2. Power (failed prop) – IDLE.
3. Propeller (failed prop) – FEATHER.

SECONDARY LOW PITCH STOP LIGHT ON

1. Propeller RPM and engine torque – Monitor.
2. The action to be taken depends on torque and propeller speed:
   (1) If propeller RPM increases and engine torque decreases – Secure engine as soon as practical.
   (2) If propeller RPM decreases and engine torque increases – Pull PROP GOV IDLE STOP circuit breaker immediately.
   (3) If propeller RPM and torque remain stable, reset the PROP GOV IDLE STOP circuit breaker.

FIRE

ENGINE/NACELLE FIRE DURING START OR GROUND OPERATION

1. Fuel firewall valves – CLOSED (LEFT and RIGHT).
2. Master switch – Down.
3. Parking brake – Set.
4. Propellers – FEATHER.
5. Evacuate aircraft.
6. Fight the fire immediately with all available fire extinguishing equipment.

ENGINE FIRE DURING FLIGHT

1. Fuel firewall valve – CLOSED.
2. Power – IDLE.
3. Propeller – FEATHER.
4. Condition lever – FUEL CUTOFF.
5. Boost pump – OFF.
6. Transfer pump – OFF.
7. Crossfeed – CLOSED.

FUSELAGE FIRE

(O) 1. Oxygen – 100% as required.

2. Vent blower – OFF.

3. Heater – OFF.

4. Fight the fire immediately with all available fire extinguishing equipment.

5. If fire cannot be extinguished – Land immediately and evacuate the aircraft.

ELECTRICAL FIRE

1. Master switch – Down.

2. All electrical switches – OFF.

3. Battery – ON.

4. Generators – On.

5. Essential equipment – ON (individually until fire source is isolated).

SMOKE AND FUME ELIMINATION

(O) 1. Crew oxygen masks – On.

(O) 2. Passenger masks – On. The copilot should confirm that all passengers are receiving supplemental oxygen.

3. Cockpit vent/storm windows – Open as required.

FUEL SYSTEM

FUEL FILLER CAP SYPHONING

1. Power – Reduce.
2. Airspeed – 120 KIAS.
3. Land as soon as practicable (maximum flap setting, APPROACH).

WING/NACELLE FUEL LEAKS

1. Power – As required.
2. Power lever (affected engine) – IDLE.
3. Propeller (affected engine) – FEATHER.
4. Condition lever (affected engine) – FUEL CUTOFF.
5. Fuel firewall valve (affected engine) – CLOSED.
6. Gear – UP.
7. Flaps – UP.
8. Power – Set.
9. Engine clean up – Perform.
10. Land as soon as practicable.

FUEL SYSTEM CROSSFEED SINGLE-ENGINE OPERATION

1. Fuel firewall valve (dead engine) – CLOSED.
2. Boost pump (dead engine) – ON.
3. Crossfeed – OPEN.
4. Fuel crossfeed light – Check illuminated.
5. Transfer pump (dead engine) – ON.
6. Boost pump (live engine) – Check OFF (side receiving crossfeed).
7. Fuel pressure – Verify (live engine).
8. Crossfeed and fuel quantity – Monitor.

ELECTRICAL SYSTEM

ONE GEN OUT LIGHT ILLUMINATED, WITH FLASHING FAULT WARN LIGHTS RU-21D

1. Generator – Reset, then ON.
2. Generator (GEN OUT light remains illuminated) – Off.
3. Electrical equipment – OFF, as required to reduce generator load to 1.0 or less.

ONE GEN OUT LIGHT ILLUMINATED, WITH FLASHING FAULT WARN LIGHT RU-21A

1. Generator – ON.
2. Generator (GEN OUT light remains illuminated) – OFF.
3. Electrical equipment – OFF, as required to reduce generator load to 1.0 or less.

BATTERY FAULT RESET LIGHT ILLUMINATED RU-21D

1. BATTERY FAULT RESET switch – Press to RESET, check switch light extinguishes.
2. Battery control relay circuit breaker (if tripped) – Reset.

BATTERY CONTROL RELAY CIRCUIT BREAKER TRIPPED RU-21D

1. Battery control relay circuit breaker – Reset.
2. Battery switch – OFF, if BATTERY CONTROL RELAY circuit breaker will not reset.

INVERTER OUT LIGHT ILLUMINATED

1. Inverter – Select other inverter
2. Inverter control circuit breakers – Reset.
3. Inverter lights remain illuminated – Return to original inverter.
4. Inverter lights still remain illuminated – Inverter OFF.
5. TACAN – OFF.
6. Land as soon as practicable.

BATTERY MONITOR LIGHT ILLUMINATED

1. Battery switch – OFF.
2. Loadmeter – Check.
3. Battery condition good – Battery switch ON.
4. Battery condition unsatisfactory – Battery ON for flap and landing gear extension only.
5. Battery – OFF.

DOOR OPEN LIGHT ILLUMINATED

1. Do not attempt to close door.
2. Land as soon as practicable.

EMERGENCY DESCENT

1. Power – IDLE.
2. Propellers – HIGH RPM.
3. Gear – DOWN.
4. Flaps – UP.
5. Airspeed – Vmo (208 KIAS).

LANDING EMERGENCIES

LANDING GEAR SYSTEM FAILURE

1. Gear control circuit breaker – Check.
2. Gear indicator circuit breaker – Check.
3. Gear power circuit breaker – Check.
4. Gear indicators – Check.
5. Gear handle – UP, then DN.
6. Gear position – Check (use air-to-air or air-to-ground fly-by method for visual landing gear position verification).

LANDING GEAR EMERGENCY EXTENSION

1. Airspeed – Below 156 KCAS (154 KIAS).
2. Gear power circuit breaker – Out (pulled).
3. Gear handle – DN.
4. Gear emergency clutch disengage lever – Pull up and turn clockwise.
5. Gear emergency extension handle – Pump the handle up and down until the three GEAR DOWN green lights illuminate. In the event of complete electrical failure, pump until resistance is felt.

GEAR-UP LANDING

1. Crew/passenger emergency briefing – Complete.
2. Loose equipment – Stow.
3. Seat belts and harnesses – Secure.
4. Gear emergency clutch disengage lever – Disengage.
5. Gear emergency extension handle – Stow.
6. Gear control breaker – In.
7. Gear handle – UP.
8. Flaps – As required.
9. Non-essential electrical equipment – OFF.
10. Condition levers – FUEL CUTOFF (on ground, when able).
11. Master switch – Down.

LANDING WITH MAIN GEAR DOWN, NOSE GEAR UP OR UNLOCKED

1. Crew/passenger emergency briefing – Complete.
2. Loose equipment – Stow.
3. Seat belts and harnesses – Secured.
4. Non-essential electrical equipment – OFF.
5. Condition levers – FUEL CUTOFF (on ground, when able).
6. Master switch – Down.

LANDING WITH ONE MAIN GEAR UP OR UNLOCKED

1. Crew/passenger emergency briefing – Complete.
2. Loose equipment – Stow.
3. Seat belts and harnesses – Secured.
4. Non-essential electrical equipment – OFF.
5. Condition levers – FUEL CUTOFF (aircraft on ground when able).
6. Master switch – Down.

LANDING WITH FLAT TIRE

1. Land on side of runway favoring good tire.
2. Brake – On good wheel only.
3. Flat nose tire – Use light braking.

DITCHING

DITCHING PROCEDURE WITH POWER

1. Announce intention to ditch and time to impact.
2. Distress message – Transmit.
3. Transponder – Emergency.
4. Life vest – Put on and adjust (do not inflate).
5. Seat belts/harnesses – Secure (passengers in braced position).
6. Gear – UP.
7. Flaps – Down.
8. Airspeed – 100 KIAS.

DITCHING PROCEDURE WITHOUT POWER

1. Announce intention to ditch and time to impact.
2. Distress message – Transmit.
3. Transponder – Emergency.
4. Life vest – Put on and adjust (do not inflate).
5. Seat belts/harnesses – Secure (passengers in braced position).
6. Gear – Up.
7. Flaps – APPROACH.
8. Airspeed – 100 KIAS.

BAILOUT

1. Radio – Distress procedure (if time permits).
2. Voice security and transponder – ZEROIZE.
3. Airspeed – Reduce.
4. Flaps – DOWN.
5. Trim – As required.
6. Main entrance door – OPEN.
7. Abandon the aircraft.

PERFORMANCE CHECKS

PITOT, STALL WARNING, FUEL VENT AND BATTERY VENT HEAT SYSTEM

1. Pitot and stall warning heat switch - ON.
2. Fuel vent heat switches (2) - ON.
3. Pitot tube - Check by feel for heat and free of obstructions.
4. Stall warning - Check by feel for heat, condition and operation.
5. Fuel vents (2) - Check by feel for heat, and free of obstructions.
6. Battery vent - Check by feel for heat, and free of obstructions.
7. Pitot and stall warning heat switch - OFF.
8. Fuel vent heat switches (2) - OFF.

OXYGEN SYSTEM

1. Oxygen supply pressure gages (left cockpit sidewall) – Check.
2. Oxygen supply pressure gage (regulator control panel) – 300 TO 400 PSI.
3. Supply control lever (green) – ON.
4. Diluter control lever (white) – 100% OXYGEN.
5. Emergency pressure control lever (red) – NORMAL.
6. Oxygen mask hose – Connect to mask hose connection.
7. Emergency pressure control lever (red) – Set to TEST MASK position while holding mask directly away from your face, then return lever to NORMAL.
8. Oxygen mask – Put on and adjust to face.
9. Emergency pressure control lever (red) – Set to TEST MASK position and check mask for leaks, then return lever to NORMAL.
10. Flow indicator – Check (during inhalation blinker appears, during exhalation blinker disappears). Repeat a minimum of 3 times.

WINDSHIELD ANTI-ICE

1. Pilot's windshield anti-ice switch – ON (watch volt-loadmeter for a slight increase).
2. Copilot's anti-ice – ON (confirm additional meter loads).
3. Reposition switches as required for flight.

AUTOPILOT SYSTEM

1. Aircraft and autopilot controls – CENTER.
2. Autopilot engage switch – ON. (Accomplish per Chapter 3, Section III.)
3. Move turn control to the left (L), then to the right (R) – Check that aircraft control wheel follows movement.
4. Rotate pitch trim control wheel forward (down) – Check that control column and trim tab control wheel follows movement.
5. Autopilot altitude switch – Press ON. Check switch remains ON.
6. Rotate the pitch trim control wheel – Check altitude switch goes OFF.
7. ILS frequency – Set.
8. Pilot's course indicator switch – VOR.
9. ILS/VOR switch – ON.
10. Control wheel and course deviation indicator on the same side – Check.
11. Move the turn control out of detent – Check ILS/VOR switch is OFF.
12. Autopilot engage switch (pilot's control wheel) – OFF, check autopilot is disengaged.

MANUAL CROSSFEED

Check by setting switch to OPEN. Check FUEL CROSSFEED light illuminates, then set switch to AUTO. Check FUEL CROSSFEED light is extinguished.

FUEL SYSTEM CROSSFEED OPERATION

1. Crossfeed switch – AUTO.
2. Left hand boost pump – OFF.
3. Annunciator panel – Monitor. Left-hand boost pump fail light and fuel crossfeed lights must come on.
4. Fuel pressure – Check (both engines).
5. Left hand boost pump – ON.
6. Crossfeed – CLOSED.
7. Crossfeed – AUTO.
8. Repeat procedure for right hand boost pump.

FUEL TRANSFER PUMPS

1. Transfer test switch – Hold to R.
2. Right transfer pump switch (while watching annunciator panel) – ON.
3. Right no fuel transfer light – Check for momentary flash.
4. Repeat check procedure for left transfer pump system.

ENGINE AUTOIGNITION SYSTEM

1. Power Levers – Advance to above 450 ft-lb torque.
2. Autoignition – ARM (check green IGNITION ARM lights illuminated).
3. Power levers – Retard to less than 350 ft-lb torque (annunciator L and R IGN ON lights illuminated, green IGNITION ARM lights extinguished).
4. Autoignition – OFF.
5. Power levers – IDLE.

PROPELLER AUTOFEATHER SYSTEM

1. Power levers – IDLE.
2. Autofeather test switch – TEST. Check AUTOFEATHER lights do not illuminate, and propellers do not feather. If switch is held in TEST position propellers will gradually feather.
3. Power levers – Advance to 500 ft-lb torque.
4. Autofeather test switch – TEST. Hold to test position and check both AUTOFEATHER lights illuminated; retard one power lever. At 350 to 450 ft-lb torque, check opposite AUTOFEATHER light extinguished. At 160 to 290 ft-lb torque, check both AUTOFEATHER lights extinguished; check propeller starts to feather.
5. Power lever – Return to 500 ft-lb torque.
6. Repeat steps 4 and 5 using the other power lever.
7. Propeller autofeather switch – ARM.
8. Both power levers – Advance to 88% to 92% minimum N_1 (observe ITT and torque limits). Check both AUTOFEATHER lights illuminated. Retard each power lever individually below 88% to 92% N_1. Check both AUTOFEATHER lights extinguished.

OVERSPEED GOVERNOR

Check by setting RPM to 2100. Hold PROP GOV TEST switches UP. RPM should decrease to 1980 to 2060. Release test switches. RPM should return to 2100.

PRIMARY GOVERNOR

Set 1900 RPM with power levers. Retard propeller levers to detent position. Check for 1725 to 1775 RPM then advance propeller levers to HGH RPM.

SECONDARY IDLE STOP

Check with condition levers in HIGH IDLE and power levers at IDLE, then while holding the secondary idle stop test switches down, move power levers slowly toward REVERSE in one continuous movement, while observing that the SECONDARY LOW PITCH STOP lights illuminate and an RPM rise of 170 to 250 is obtained. Release the test switch and RPM should increase. Return power levers to normal idle position and cancel lights in annunciator panel by actuating secondary flight idle test switch if they remain illuminated.

HEALTH INDICATOR TEST (HIT)

1. Face aircraft into wind and insure that deice system is OFF.
2. Set both engines at LO IDLE.
3. Read free air temperature.
4. Enter log FAT line at value nearest to free air temperature.
5. Adjust engine N_1% to value shown in log N_1% line.
6. Adjust speed of engine in check to 1900 RPM and stabilize instruments (minimum 30 seconds).
7. Read ITT from indicator.
8. Compare indicator ITT with log value shown in line labeled "Baseline ITT".
9. Record aircraft or engine hours and difference (±) between indicated ITT and Baseline ITT in log section provided.
10. If the ITT difference is 20°C or greater, perform the following actions:
    (1) 20°C to 29°C, aircraft may be flown, but an entry shall be made on DA Form 2408-13.
    (2) 30°C or greater, aircraft shall not be flown until the cause of excessive ITT is determined. An entry shall be made on DA Form 2408-13.

CREW/PASSENGER BRIEFING

CREW INTRODUCTION

EQUIPMENT

1. Personal to include ID tags.
2. Professional.
3. Survival.

FLIGHT DATA

1. Route.
2. Altitude.
3. Time en route.
4. Weather.

NORMAL PROCEDURES

1. Entry and exit of aircraft.
2. Seating.
3. Seat belts.
4. Movement in aircraft.
5. Internal communications.
6. Security of equipment.
7. Smoking.
8. Oxygen.
9. Refueling.

10. Weapons.
11. Protective masks.
12. Parachutes.

EMERGENCY PROCEDURES

1. Emergency exits.
2. Emergency equipment.
3. Emergency landing/ditching procedures.
4. Bail out.

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons